NMSS/RGN-005

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

March 17, 2000

Mr. R. P. Powers
Senior Vice President
Nuclear Generation Group
American Electric Power Company
1 Cook Place
Bridgman, MI 49106

SUBJECT: D. C. COOK INSPECTION REPORT 50-315/99022(DRP); 50-316/99022(DRP)

Dear Mr. Powers:

This refers to the inspection conducted on January 14, 2000, through February 25, 2000, at the D. C. Cook Units 1 and 2 reactor facilities. The inspection was an examination of activities conducted under your license as they relate to compliance with the Commission rules and regulations and with the conditions of your license. Areas reviewed included Operations, Maintenance, Engineering, and Plant Support. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. The inspectors also reviewed observations and findings as they related to the NRC Manual Chapter 0350 Case Specific Checklist for D. C. Cook. The enclosed report presents the results of that inspection.

During this inspection period, we noted that you continued to make progress towards completing activities required to support plant restart. For example, Unit 2 ice loading activities were nearing completion and testing activities on the emergency core cooling systems were in progress. Of particular importance, the inspectors observed that these critical activities were being conducted in a methodical, and conservative manner. We also observed portions of the residual heat removal system turnover to operations, and noted that the system managers and senior reactor operators were knowledgeable, appropriately communicated significant system issues, and were effectively implementing the process. Additionally, we concluded that your System Indexed Database System (SIDS) was appropriately being used to track and disposition potential restart related items. The inspectors reviewed a sample of SIDS items which were being deferred for post restart resolution, and determined these items were being adequately controlled, evaluated and documented by your staff.

The enclosed report also documents the closure of the following NRC Manual Chapter 0350 Guidelines for Restart Approval items: C.2.1.a: "Effectiveness of Quality Assurance Program," C.2.1.d: "Effectiveness of Deficiency Reporting System," C.3.1.a: "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Staff)," C.3.2.a: "Demonstrated Commitment to Achieving Improved Performance

Through the Results of the Programmatic Readiness Assessment (Corporate Support)," and C.5.e: "Confirmatory Action Letter Conditions Have Been Satisfied." The NRC Manual Chapter 0350 panel determined that you had taken adequate corrective actions to address the above items.

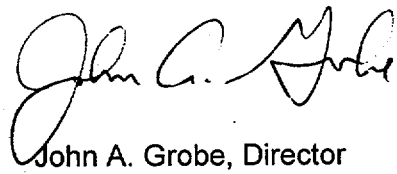
However, we identified a number of equipment configuration control deficiencies during the inspection period. The specific circumstances relating to these issues are detailed in the enclosed inspection report. In some cases, we noted that there were adequate procedures in place to control equipment configuration; however, these procedural requirements were not followed. In other cases, plant procedures did not ensure that plant configurations were consistent with Final Safety Analysis Report or Technical Specification requirements. We noted that these configuration control deficiencies were often associated with operation during infrequently used equipment lineups or unusual plant conditions. Because of the current defueled plant condition, we concluded that these configuration control deficiencies had minimal safety significance. However, as the plant progresses through core reload and mode ascension, additional systems will be returned to service and required to be operable. These anticipated changes in system status will bring more complexity and greater safety significance to equipment configuration control issues.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred involving the control of an auxiliary building pressure boundary door. This was considered a failure to meet the requirements of Technical Specification 6.8.1, "Procedures and Programs."

This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. This NCV is described in the subject inspection report. If you contest the violation or severity level of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to the Regional Administrator, Region III; and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be placed in the NRC Public Document Room.

Sincerely,



John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
License Nos. DPR-58; DPR-74

cc w/encl: A. C. Bakken III, Site Vice President
J. Pollock, Plant Manager
M. Rencheck, Vice President, Nuclear Engineering
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Emergency Management Division
MI Department of State Police
D. Lochbaum, Union of Concerned Scientists

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Sincerely,

/s/ J. Grobe

John A. Grobe, Director
Division of Reactor Safety

Docket Nos. 50-315; 50-316
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-315; 50-316
License Nos:	DPR-58; DPR-74
Report No:	50-315/99022(DRP); 50-316/99022(DRP)
Licensee:	American Electric Power Company 1 Cook Place Bridgman, MI 49106
Facility:	D. C. Cook Nuclear Generating Plant
Location:	1 Cook Place Bridgman, MI 49106
Dates:	January 14, 2000, through February 25, 2000
Inspectors:	B. L. Bartlett, Senior Resident Inspector K. A. Coyne, Resident Inspector R. G. Krsek, Resident Inspector - Palisades J. D. Maynen, Resident Inspector
Approved by:	A. Vegel, Chief Reactor Projects Branch 6 Division of Reactor Projects

EXECUTIVE SUMMARY

D. C. Cook Units 1 and 2
NRC Inspection Report 50-315/99022(DRP); 50-316/99022(DRP)

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection activities and includes follow-up to issues identified during previous inspection reports.

Operations

- During a routine plant tour, the inspectors identified that the licensee had inappropriately blocked open an auxiliary building pressure boundary door. The door serves as a barrier which is designed to mitigate the potential for an unfiltered release. The auxiliary building pressure door was blocked open to allow a drain hose to be routed through the door, but contrary to plant procedures, the blocked open door was not continuously monitored. The inspectors concluded that the licensee's failure to maintain configuration control of the auxiliary building pressure boundary in accordance with plant managers procedure PMP 4030.001.002 constituted a non-cited violation of TS 6.8.1. (Section O1.2)

- The inspectors identified that the licensee failed to maintain adequate configuration control over the manual operation of a motor operated recirculation sump isolation valve after a Type C containment leak rate test failure. Because the reactor was defueled at the time of the occurrence and containment integrity was not required, the failure to adequately implement configuration control procedural requirements was of minimal safety significance and constituted a minor violation. (Section O1.3)

- The operators responded appropriately to indications of air binding in the Non-Essential Service Water (NESW) system. However, during the recovery of plant air which followed the loss of NESW, the licensee identified that the operators installed a temporary bypass jumper around an air header isolation valve without performing the appropriate reviews as required by the licensee's temporary modifications procedure. A minor violation was identified. (Section O1.4)

- The inspectors identified that control power was not removed from the residual heat removal (RHR) suction motor operated valves to preclude the potential loss of RHR system flow, contrary to the Final Safety Analysis Report Section 9.3.2 requirements. The licensee had previously identified that the procedure controlling operation of the RHR suction valves did not provide adequate instructions to remove control power, but failed to take prompt corrective action for this deficiency. Because the reactor was defueled at the time of this event, this failure had minimal safety significance and constituted a minor violation. (Section O3.1)

- The inspectors reviewed a selection of items which were originally characterized as having to be completed prior to the Unit 2 restart and subsequently deferred to be completed post Unit 2 restart. The inspectors noted that, except for one minor discrepancy, the deferrals were adequately justified. The approved scope deferrals were reviewed and approved by a system manager, the outage scope management team, and a senior reactor operator. (Section O7.1)

Maintenance

- The licensee established an integrated team to oversee open vessel testing. (Open vessel testing was a series of tests designed to exercise infrequently used ECCS piping and determine injection flow balance.) The inspectors concluded that the licensee was conducting the open vessel testing of the Unit 2 ECCS in a methodical, conservative manner. (Section M1.1)

- The licensee revised a plan to install a temporary suction strainer on the Unit 2 East Centrifugal Charging Pump to allow the work control process to control the installation rather than a procedure. The inspectors determined that the licensee's revised plan would have bypassed the procedure's 10 CFR 50.59 safety evaluation for installation of the temporary strainer. Subsequently, the licensee took corrective actions to ensure that the installation of the strainer was evaluated through the 10 CFR 50.59 evaluation process. (Section M1.2)

- Engineering support to resolve known configuration control weaknesses in a spent fuel pool ventilation system surveillance procedure was weak. The inspectors identified that the procedure did not control or limit the operation of other interfacing ventilation systems. System engineering personnel knew about the weaknesses in the surveillance procedure, but action had not yet been taken to address these weaknesses. The inspectors also noted that engineering had not informed operations about the configuration control weaknesses. (Section M3.1)

Engineering

- Modification work of structural door restraints on maintenance access doors for the component cooling water pumps was performed in accordance with the plant procedures and the design change package. The modification reinforced three maintenance doors to ensure the postulated effects of a high energy line break would not adversely impact the Unit 2 component cooling water pumps. (Section M1.1)

- The inspectors determined that the system return to operations process effectively evaluated and resolved issues associated with the residual heat removal system. The system managers and senior reactor operators were knowledgeable, appropriately communicated significant systems issues, and were effectively implementing the process. (Section E2.2)

- The inspectors determined that the licensee's implementation of maintenance rule performance criteria for residual heat removal system shutdown cooling function were not comprehensive. The licensee documented this issue in their corrective action system for evaluation and resolution. (Section E2.2)

Report Details

Summary of Plant Status

Unit 1 remained defueled throughout the inspection period. The licensee continued work in support of the Unit 1 steam generator replacement project, including removal and installation of portions of the steam generators.

Unit 2 also remained defueled throughout the inspection period. The licensee continued to make progress on activities leading toward restart. For example, system turnover activities and open vessel testing of the emergency core cooling systems were in progress. Additionally, the licensee had nearly completed the loading of the Unit 2 ice condenser ice baskets by the end of the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

The inspectors conducted frequent observations of control room activities and equipment operation during the extended outage of both reactor units. Overall, plant operations were performed using approved operating procedures and reflected good operating practices. Noteworthy observations and findings are detailed in the report sections which follow.

O1.2 Failure to Consider Ventilation Boundary Requirements Prior to Blocking Open an Auxiliary Building Pressure Boundary Door

a. Inspection Scope (71707, C.4.d)

During a routine plant tour on February 2, 2000, the inspectors observed auxiliary building pressure boundary door 1-DR-AUX-391 blocked open and unattended. Door 1-DR-AUX-391 was the primary access door to the auxiliary building from the turbine building and had been blocked open to allow a drain hose to be routed to the auxiliary building sump. The inspectors informed control room personnel and questioned the effect of the blocked door on auxiliary building ventilation.

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.4.d, "Adequacy of System Lineups."

b. Observations and Findings

Control room personnel determined that the door being blocked open affected the negative pressure requirements of Technical Specification (TS) 3.7.6.1, Engineered Safety Features Ventilation System. Because door 1-DR-AUX-391 was part of the auxiliary building pressure boundary, it was required by procedure to be attended at all times when blocked open. Additionally, door 1-DR-AUX-391 was a fire door and a High Energy Line Break (HELB) separation door and appropriate compensatory measures for

these functions had been implemented. Licensee personnel determined that when the door was blocked open the ventilation requirements were overlooked even though the door was labeled as a ventilation barrier. After the inspectors identified the blocked open door, the licensee wrote Condition Report (CR) 00-1987 to document the issue. The operators removed the drain hose running through the doorway and closed the door.

Technical Specification 6.8.1 requires, in part, that written procedures shall be established, implemented and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide (RG) 1.33, Revision 2, February 1978. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," Revision 2, February 1978, Appendix A, recommended, in part, that procedures be written to cover operation of auxiliary building ventilation. Plant Managers Procedure (PMP) 4030.001.002, Revision 1, "Administrative Requirements for Ventilation Boundary and High Energy Line Break Barriers," addressed the administrative requirements for blocking open ventilation boundary door 1-DR-AUX-391. Step 4.7 of PMP 4030.001.002, allowed an auxiliary building pressure boundary barrier to be blocked open provided that the open barrier was continuously monitored. Contrary to the above, on February 2, 2000, the inspectors identified there was inadequate configuration control in that auxiliary building pressure boundary barrier 1-DR-AUX-391 was blocked open and was not monitored as required by procedure. The inspectors determined that the failure to follow plant procedural requirements was a Violation of Technical Specification 6.8.1. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Appendix C of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as CR 00-1987 (NCV 50-315/316/99022-01).

The inspectors questioned licensee personnel as to whether the door being blocked open affected the TS 4.9.12.d.4 requirement to maintain the spent fuel pool area at a negative 1/8-inch water gauge pressure. The licensee was unable to demonstrate that the spent fuel pool area would be unaffected by the open auxiliary building door. The spent fuel pool area was observed to be at a negative pressure with respect to the outside atmosphere, but the absolute magnitude of the negative pressure was unknown. The action statement for TS 3.9.12 required, in part, that with the spent fuel pool ventilation system inoperable, movement of fuel with the spent fuel pool be suspended and crane operation of loads over the pool also be suspended. Although there was movement of steam generator heavy loads around the spent fuel pool during the time that the door was blocked open, no fuel movements were performed. The inspectors assessed the licensee's procedure for performing the TS surveillance test which verified the spent fuel pool area negative pressure requirements. This assessment is discussed in Section M3.1, below.

There was no TS requirement for the auxiliary building to be at a specific negative pressure. However, procedure PMP 4030.001.002 required that a blocked open pressure boundary door be immediately closed if air flow out of the auxiliary building was identified. The inspectors and the licensee determined that while the door was blocked open the auxiliary building was at a negative pressure with respect to the turbine building.

c. Conclusions

During a routine plant tour, the inspectors identified that the licensee had inappropriately blocked open an auxiliary building pressure boundary door. The auxiliary building pressure door was blocked open to allow a drain hose to be routed through the door, but contrary to plant procedures, the blocked open door was not continuously monitored. The inspectors concluded that the licensee's failure to maintain configuration control of the auxiliary building pressure boundary in accordance with procedure PMP 4030.001.002 constituted a non-cited violation of TS 6.8.1.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.d, "Adequacy of System Lineups." The inspectors noted that, although the licensee had failed to maintain adequate configuration control of an auxiliary building pressure boundary door, the safety significance of this event was minimal. The licensee's immediate corrective actions to address this issue were prompt and reasonable. In addition, a CR was initiated to document the issue and track and trend corrective actions.

O1.3 Failure to Maintain Adequate Configuration Control of Recirculation Sump Isolation Motor Operated Valve (Unit 2)

a. Inspection Scope (71707, C.4.d)

On January 24, 2000, 2-ICM-305, the "A" Train containment recirculation sump isolation motor operated valve failed an Appendix J, Type C local leak rate test. The licensee conducted an investigation and determined that the test failure was due to 2-ICM-305 not being closed with the motor operator prior to the start of the test. The inspectors assessed the circumstances surrounding this event. The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.4.d, "Adequacy of System Lineups."

b. Observations and Findings

Type C testing of 2-ICM-305 was performed in accordance with 2-Engineering Head Procedure (EHP) Surveillance Test Procedure (STP).203, "Type B and C Leak Rate Test." The test valve lineup in 2-EHP STP.203 required 2-ICM-305 to be initially opened to drain the sump suction piping and then shut using the motor operator prior to the test. Because the sump suction had been drained prior to performance of the test, the test engineer modified this valve lineup as allowed by Step 4.21 of the test procedure. Consequently, the test engineer did not require 2-ICM-305 to be opened and shut using the motor operator, but instead verified that 2-ICM-305 was closed using control board valve position indication lights.

Prior to the start of the Type C test on January 24, 2000, 2-ICM-305 was manually operated in the shut direction to facilitate removal of the valve enclosure. Although the intent of this manual operation was not to close and seat the valve, the valve operation was sufficient to close the valve position shut limit switch and illuminate the control room shut indication for 2-ICM-305. Because 2-ICM-305 was not fully seated using the normal motor operator, the measured leak rate during the subsequent type C test was approximately 21,000 standard cubic centimeters per minute (sccm). Although this leak rate was above the acceptance criteria of 2,700 sccm, the total combined leak rate for

type B and C tested penetrations remained less than 60 percent of the maximum allowable leak rate specified in TS 3.6.1.2, "Containment Leakage." At the time the test was performed, primary containment integrity was not required. The licensee initiated CR 00-1331 and Action Request (AR) A196964 to document the test failure. The licensee concluded that the test failure was due to 2-ICM-305 not being fully shut by the prior manual operation. Operations personnel subsequently shut 2-ICM-305 using the motor operator and satisfactorily retested the valve on January 28, 2000.

Procedure PMP 4043.APC.001, "Abnormal Position Control," Revision 0, Step 3.1.8 required, in part, that all components placed in an abnormal position be caution tagged to maintain configuration control. Similarly, PMP 4043.VLU.001, "Valve Lineups and Position Control," Revision 0, stated that "if a motor operated valve is placed on the backseat, or is manually operated, then PMP 4043.APC.001, Abnormal Position Control, requires that a caution tag is placed on the valve control switch denoting that an operability concern may exist. Contrary to these requirements, a caution tag was not placed on 2-ICM-305 following its manual operation and therefore adequate configuration control of the valve position was not maintained. On February 17, 2000, the licensee initiated CR 00-2858 to document the failure to maintain adequate configuration control of 2-ICM-305. Because manual operation of motor operated valves could degrade either their seat leak tightness or the ability of the motor operator to move the valve, adequate configuration control of these valves is required to ensure that operability concerns are identified and evaluated. In this case, because the reactor was defueled, containment integrity was not required, and the valve was subsequently retested satisfactorily, the safety significance associated with the failure to maintain configuration control over 2-ICM-305 was minimal. Consequently, this failure constituted a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

The inspectors identified that the licensee failed to maintain adequate configuration control over the manual operation of a motor operated recirculation sump isolation valve after a Type C containment leak rate test failure. Because the reactor was defueled at the time of the occurrence and containment integrity was not required, the failure to adequately implement configuration control procedural requirements was of minimal safety significance and constituted a minor violation.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.4.d, "Adequacy of System Lineups." The inspectors noted that, although the licensee had failed to maintain adequate configuration control of a motor operated valve, the safety significance of the event was minimal. Licensee immediate corrective actions to address this issue were prompt and reasonable. In addition, a CR was initiated to document the issue, and to track and trend corrective actions.

O1.4 Installation of Unauthorized Temporary Modification After Loss of All Non-Essential Service Water

a. Inspection Scope (71707)

On January 21, 2000, operations personnel shut down the Unit 1 circulating water system due to weather conditions conducive to the formation of frazil ice. On

January 23, 2000, shortly after re-establishing circulating water flow, the Unit 1 North Non-Essential Service Water (NESW) pump became air bound. The inspectors followed the licensee's response to this event.

b. Observations and Findings

b.1 Loss of NESW

On January 21, 2000, as part of the circulating water shutdown procedure, the NESW pump suction supply was swapped from the normal supply to the to the alternate supply. The Unit 1 NESW pump was supplying flow for both units. On January 23, 2000, the licensee started a circulating water pump and throttled the circulating water flow to establish the desired discharge pressure of 9 psig. About 41 minutes after starting the circulating water pump, the Unit 1 north NESW pump discharge pressure and motor amps decreased, indicating air binding of the pump suction. Shortly after that, the Unit 1 south NESW pump automatically started on low header pressure and displayed the same symptoms of air binding. The operators manually shut off both pumps. Due to the loss of NESW cooling, the operators also stopped all of the operating air compressors. Fifteen minutes after stopping NESW, the operators returned the NESW suction lineup to the normal supply and restarted the Unit 1 north NESW pump. The operators verified that NESW flow and pressure were restored and started the Unit 1 plant air compressor and both units' control air compressors. The Unit 2 plant air compressor was not started due to low lubricating oil temperature.

The licensee established a rapid event response team to evaluate the cause of the loss of NESW. The licensee's team concluded that air, which was released out of solution downstream of the circulating water throttling valve, was entrained in the NESW alternate suction line. The licensee's team also identified that the corrective actions for an earlier air binding event in 1999 were not fully effective. Following the 1999 event, 01-Operating Head Procedure (OHP) 4021.057.001, "Circulating Water System Operation," was revised to include a note which stated, "It is preferred to shift NESW suction to the intake tunnel after Circulating Water is placed in service to prevent air entrainment into the NESW header." The licensee's team concluded that the placement and wording of the note were not effective in preventing the second air binding event. Condition Report 00-1269 was written to document this event.

On February 11, 2000, the licensee issued a revision to 01-OHP 4021.057.001 which strengthened the wording of the note and emphasized the time sensitivity of shifting the NESW suction supply after circulating water was started. The inspectors reviewed the rapid event response team findings and corrective actions and determined that the actions appeared appropriate to prevent recurrence.

b.2 Installation of Plant Air Header Bypass Jumper

On January 23, 2000, as a result of the loss of NESW, the operators stopped the Unit 1 plant and control air compressors. Due to lowering plant air pressure, the plant air crosstie valves, 2-PRV-20 and 2-PRV-21 automatically closed. These valves were intended to isolate the Unit 1 plant air header from the Unit 2 plant air header in the event of a rupture in one unit's plant air system. After NESW flow was restored, the operators started the Unit 1 plant air compressor and both units' control air compressors. The operators restored the Unit 2 plant air pressure by installing a bypass

jumper around plant air crosstie valve 2-PRV-20 and slowly bleeding air from the Unit 1 plant air header. After both air headers were equalized in pressure, the bypass jumper was removed.

After the recovery of NESW, operations personnel reviewed the control room logs and wrote CR 00-1275 to document that the installation of the bypass jumper represented an unauthorized temporary modification. Final Safety Analysis Report (FSAR) Section 9.8.2, "Compressed Air Systems," documented that the function of the air-operated isolation valves was, in part, to completely isolate either unit's plant air system. Procedure EHP 5040.MOD.001, "Temporary Modifications," provided guidance for making changes to the plant which could affect equipment function as described in the FSAR. Contrary to the above, the licensee identified that the operators had failed to follow EHP 5040.MOD.001 when installing the bypass jumper to equalize plant air header pressure between the units. The bypass jumper prevented the automatic isolation of the plant air headers while it was installed. Because both reactors were defueled, there was minimal safety significance associated with the inability to isolate the plant air headers. Consequently, the inspectors determined that the failure to follow EHP 5040.MOD.001 to install the bypass jumper constituted a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

The operators responded appropriately to indications of air binding in the Non-Essential Service Water (NESW) system. However, during the recovery of plant air which followed the loss of NESW, the licensee identified that the operators installed a temporary bypass jumper around an air header isolation valve without performing the appropriate reviews as required by the licensee's temporary modifications procedure. A minor violation was identified.

O3 Operations Procedures and Documentation

O3.1 Inadequate Corrective Action for Identified Procedure Deficiency Results in Violation of FSAR Requirements (Unit 2)

a. Inspection Scope (71707, C.2.1.d, C.4.d)

On February 14, 2000, the inspectors identified that control power was supplied to the residual heat removal system (RHR) hot leg suction valves contrary to FSAR requirements. The inspectors assessed the circumstances surrounding this event. The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.2.1.d, "Effectiveness of Deficiency Reporting System," and C.4.d, "Adequacy of System Lineups."

b. Observations and Findings

On February 3, 2000, plant operators began restoration from Reactor Coolant System (RCS) draindown in accordance with Procedure 02-OHP 4021.002.012, "Restoration from RCS Draindown," Revision 1. The objective of this procedure was to fill the RCS and reactor cavity with the core offloaded and to align the RHR system for shutdown cooling. On February 5, 2000, with RCS restoration from draindown still in progress, a member of the licensee's plant engineering testing group identified that

Procedure 02-OHP 4021.002.012 conflicted with the FSAR and initiated CR 00-2149. Specifically, FSAR Section 9.3.2 stated that when the RCS was open to atmosphere, power to both RHR motor operated suction isolation valves (IMO-128 and ICM-129) would be locked out to preclude inadvertent closure of the valves. Spurious closure of either of the RHR suction valves could result in a loss of net positive suction head to an operating RHR pump and subsequent loss of RHR system flow. Condition Report 00-2149 identified that Step 4.20 of 02-OHP 4021.002.012, which aligned RHR system suction from the refueling water storage tank to the loop 2 hot leg, did not provide procedure steps to control the connection and disconnection of power to the RHR suction valve motor operators.

The shift technical advisor (STA) conducted an operations review of CR 00-2149 on February 5, 2000, but failed to recognize that an RHR pump would be in operation during performance of Step 4.20. Consequently, the STA incorrectly concluded that the procedure complied with FSAR requirements and the identified deficiencies in Procedure 02-OHP 4021.002.012 were not promptly corrected. On February 6, 2000, plant operators aligned the RHR suction to the loop 2 hot leg in accordance with Procedure 02-OHP 4021.002.012 Step 4.20. The procedure did not provide specific steps to disconnect control power from these suction valves, and the operators failed to lock out control power to 2-IMO-128 and 2-ICM-129. Following completion of Procedure 02-OHP 4021.002.012 on February 7, 2000, operations personnel transitioned the control of RHR system operation to the normal RHR system operation Procedure 02-OHP 4021.017.001, "Operation of the Residual Heat Removal System." The inspectors reviewed the RHR normal operating Procedure 02-OHP 4021.017.001, and determined that the procedure lacked steps that would have removed control power from the RHR suction valves prior to core reload. Procedural steps for the connection, disconnection, and lock out of control power to 2-IMO-128 and 2-ICM-129 were contained in Procedure 02-OHP 4021.017.002, "Placing in Service the Residual Heat Removal System," which addresses startup of the RHR system during RCS cooldown from Mode 4 (T_{avg} between 200°F and 350°F).

10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," stated, in part, that measures shall be established that conditions adverse to quality are promptly identified and corrected. Contrary to this requirement, the procedural deficiencies identified in CR 00-2149 were not promptly corrected prior to operations personnel performing the affected procedure steps. Because the reactor was defueled at the time of this occurrence, the safety significance of this event was minimal. Therefore, this failure constituted a violation of minor significance and is not subject to formal enforcement action.

After the inspectors questioned the failure to lock out control power to 2-IMO-128 and 2-ICM-129, the licensee removed and locked out control power to the valves and initiated CR 00-2708. Condition Report 00-2708 also identified several other procedures that required revision to appropriately address the lock out of control power to 2-IMO-128 and 2-ICM-129. Procedure 02-OHP 4021.002.012 was placed in administrative hold pending resolution of the discrepancy between the procedure and FSAR requirements. Additionally, the operations department evaluation of CR 00-2149 was reopened for further review.

c. Conclusions

The inspectors identified that control power was not removed from the residual heat removal (RHR) suction motor operated valves to preclude the potential loss of RHR system flow, contrary to the Final Safety Analysis Report Section 9.3.2 requirements. The licensee had previously identified that the procedure controlling operation of the RHR suction valves did not provide adequate instructions to remove control power, but failed to take prompt corrective action for this deficiency. Because the reactor was defueled at the time of this event, this failure had minimal safety significance and constituted a minor violation.

The inspectors assessed this event as it related to NRC Restart Action Plan 0350 Item C.2.1.d, "Effectiveness of Deficiency Reporting System," and C.4.d, "Adequacy of System Lineups." Although the safety significance of the failure to comply with FSAR requirements was minimal, the licensee failed to take prompt corrective action for an identified procedural deficiency associated with control of system configuration.

O7 Quality Assurance in Operations

O7.1 Deferral of Restart Activities (Unit 2)

a. Inspection Scope (61726, C.4.e, C.4.i)

The System Indexed Database System (SIDS) was used by the licensee to track issues that potentially needed to be addressed prior to restart, including issues identified by the Expanded System Readiness Reviews. The inspectors reviewed items in the program originally designated as required for Unit 2 restart and subsequently deferred as items allowed to be completed after the Unit 2 restart. Attachment 11 to Plant Manager's Procedure (PMP) 7200.RST.004, "Expanded System Readiness Review Program," Revision 10b, provided criteria and instructions for removing a SIDS open item from the restart work scope. The inspection consisted of a review of applicable documentation for deferred items and interviews with appropriate licensee personnel. Additionally, the inspectors reviewed the deferred items as they related to NRC Restart Action Plan 0350 Items C.4.e, "Adequacy of Surveillance Tests and Test Program," and C.4.i, "Maintenance Backlog Managed and Impact on Operations Assessed."

b. Observations and Findings

The inspectors reviewed the PMP 7200.RST.004 Attachment 11 forms for approximately 100 SIDS items out of a total population of approximately 2000 SIDS items which had been deferred. An additional 40 SIDS items were sampled as part of the Residual Heat Removal system turnover review documented in Section E2.2 below. The inspectors noted that the Attachment 11 forms for the deferred item in both samples were completed in accordance with the procedure and reviewed by the appropriate personnel.

During the review, the inspectors identified one Attachment 11 form (tracking number 000107002) which included both preventive maintenance (PM) activities and Technical Specification (TS) surveillances. The justification for the deferral documented on the Attachment 11 stated that, "These items have PM frequencies of 1R and 2R and the Unit has not been in service since the last calibration. Based on this, the frequency

has been met and the PM activities are not needed at this time." The inspectors reviewed the activities from Attachment 11 number 000107002 in the licensee's database system and noted that the deferred activities all had required periodicities of 1R or 2R. For a preventive maintenance item, the licensee identified a periodicity of 1R as once per refueling outage. However, for a TS surveillance, the Technical Specifications defined "R" as once per 549 days.

The inspectors discussed this issue with the system manager who verified that some of the deferred activities were TS required surveillances. The system manager also confirmed that some of the deferred TS surveillances were required to be completed prior to restart, contrary to the approved scope change of the Attachment 11. The system manager recognized "R" as an event-based refueling frequency rather than a period of time defined by the Technical Specifications. In addition, the action requests and job orders on the Attachment 11 were interpreted by the system manager to be PM activities rather than as TS surveillances. The system manager wrote (CR) 00-2065 to document the discrepancies in interpretation between PM activities and TS surveillances.

The inspectors also discussed the issue of deferred TS surveillances with the licensee's work control surveillance group supervisor. The surveillance group supervisor stated that the surveillance group had begun its own investigation into deferred TS surveillances and had previously written CR 00-2114 to document their findings. Condition Report 00-2114 documented seven inappropriately deferred TS surveillances. The surveillance group supervisor stated that the group's review of deferred items was ongoing and that they had identified approximately 12 additional TS surveillances which were inappropriately deferred in the SIDS to be completed after Unit 2 restart. In addition, the surveillance group supervisor noted that TS surveillance due date requirements were tracked using the Surveillance Requirements Database (SRDB) which was independent of SIDS. The SRDB identified all TS surveillance requirements due in the current mode and all TS surveillances which were required prior to entering a new mode. The inspectors verified that the deferred TS surveillances were scheduled to be completed in the SRDB; therefore, the inspectors concluded that the deferred TS surveillances would have been properly scheduled.

The inspectors reviewed the deferred items as they related to NRC 0350 Case Specific Checklist Items C.4.e, "Adequacy of Surveillance Tests and Test Program," and C.4.i, "Maintenance Backlog Managed and Impact on Operations Assessed." The inspectors determined that the licensee's efforts to review SIDS items and defer item until after the Unit 2 restart were consistent with managing the backlog. In addition, the work control surveillance group's review of the deferred items demonstrated that the licensee's surveillance test program was ensuring that TS surveillance requirements would be properly scheduled.

c. Conclusions

The inspectors reviewed a selection of items which were originally characterized as having to be completed prior to the Unit 2 restart and subsequently deferred to be completed post Unit 2 restart. The inspectors noted that, except for one minor discrepancy, the deferrals were adequately justified. The approved scope deferrals were reviewed and approved by a system manager, the outage scope management team, and a senior reactor operator.

The minor discrepancy identified by the inspectors involved an inappropriate deferral for several TS surveillances. The inspectors concluded that the TS surveillances would have been properly scheduled because the licensee's work control surveillance group maintained an independent Surveillance Requirements Database which was used to schedule TS surveillances.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (62707)

The inspectors observed all or portions of the following maintenance activities and reviewed associated documentation:

- 02-EHP 4030.STP.203.001, "Unit 2 ECCS [Emergency Core Cooling System] Flow Balance - Boron Injection System," Revision 0.
- 02-EHP 4030.STP.208.001, "ECCS Flow Balance - Safety Injection System," Revision 0.
- Job Order (JO) C45952, Unit 2 ice basket filling and loading
- JO C53940, Fabricate material for Design Change Package DCP-4258
- JO R36402, Perform motor operated valve preventive maintenance on 2-ICM-251

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.1.2.e, "Corrective Actions Include Restoring Systems and Equipment to Service," C.4.a, "Operability of TS systems," and C.4.f, "Significant Hardware Issues Resolved."

b.1 Open Vessel Testing

The inspectors concluded that the observed work was performed in accordance with procedures. The current revision of the appropriate procedures were in use at the work sites, and proper work safety and radiological protection practices were noted. Work items were appropriately scheduled in the plan of the day. Noteworthy observations and findings are detailed below and in the report sections which follow.

On February 1, 2000, the licensee began open vessel testing on Unit 2. Open vessel testing consisted of a series of tests on the emergency core cooling systems (ECCS) which were conducted with the reactor vessel head removed. The tests were designed to determine the performance characteristics of the ECCS pumps, establish flow balances for safety injection, and exercise portions of the systems which were not routinely tested. The inspectors observed portions of the open vessel testing, attended test meetings, and discussed the testing with licensee personnel. The inspectors noted

that the licensee had formed an integrated open vessel testing oversight team which included members from all of the involved departments. The team met frequently to discuss the open vessel testing schedule, issues, and problems. The inspectors observed that several of the ECCS pump performance and flow balancing tests were repeated after the oversight team reviewed the initial data and questioned the accuracy of the test results. Additionally, the inspectors noted that the licensee's Performance Assurance department was providing oversight of open vessel testing.

b.2 Installation of High Energy Line Break Modification

The licensee documented in CR 98-2383, CR 99-9572, and CR 99-9815 that requirements to protect safe shutdown equipment from the effects of an assumed design basis break in high energy lines were not being met. In Unit 2, two main steam lines and one main feedwater line are routed near the CCW pumps. The high energy lines are separated from the CCW pumps by a substantial concrete wall; however, there were three maintenance access doors penetrating the wall. The licensee could not find calculations or analysis that ensured the doors could withstand the effects of a postulated HELB.

Design change package (DCP) 2-DCP-4258 was issued on January 17, 2000, to modify the doors to withstand the loading from a postulated HELB in the vicinity of the doors. The field implementation of the DCP was performed under Action Request (AR) A194572 and Job Orders (JO) C53940, C53942, and C53943. The inspectors reviewed the DCP, ARs, and JOs, and observe a portion of the field installation of DCP-4258. The DCP installed quarter inch steel plate over the doors and straps to hold the doors in place.

The inspectors determined that the work was performed in accordance with procedures and required concrete drilling and welding permits were obtained prior to any field work being performed. When reinforcing bars were encountered during the concrete drilling, the workers requested the appropriate documentation prior to performing additional drilling.

c. Conclusions

The licensee established an integrated team to oversee open vessel testing. Open vessel testing was a series of tests designed to exercise infrequently used ECCS piping and determine injection flow balance. The inspectors concluded that the licensee was conducting the open vessel testing of the Unit 2 ECCS in a methodical, conservative manner.

The inspectors performed routine assessment of design change package 4258, structural door restraints. The modification reinforced three maintenance doors to ensure the postulated effects of a high energy line break would not adversely impact the Unit 2 component cooling water pumps. The work was performed in accordance with the plant procedures and the design change package.

M1.2 Potential 10 CFR 50.59 Bypass For Temporary Strainer Installation (Unit 2)

a. Inspection Scope (62707)

On February 22, 2000, the inspectors attended a daily licensee meeting regarding the status of open vessel testing. One of the items discussed was a change to the licensee's plan to install a temporary suction strainer on the Unit 2 East ("A" Train) Centrifugal Charging Pump (CCP). The original plan was to install the strainer as directed by the recirculation leakage test procedure, but the revised plan appeared to use the work control process to control the installation. The licensee's revised plan to use the work control process to control the strainer installation in lieu of a procedure appeared to bypass the 10 CFR 50.59 safety evaluation which had been completed for the procedure. The inspectors interviewed licensee personnel and reviewed the licensee's procedures regarding temporary modifications.

b. Observations and Findings

The licensee planned to install a suction strainer on the Unit 2 East CCP to support the performance of procedure 2 EHP SP.126, "ECCS [Emergency Core Cooling System] Recirculation Leakage Test." The recirculation leakage test was being performed, in part, to establish flow through portions of ECCS piping which had not been tested since initial plant construction. The Unit 2 east CCP suction strainer was being installed to protect the CCP from foreign material which might have been present in the ECCS piping. Once the test was complete, the licensee planned to remove the strainer and restore the charging system to its design configuration.

The licensee had originally planned to control the CCP strainer installation and removal as part of the recirculation test procedure, and the recirculation test procedure had received appropriate reviews and a safety screening to ensure that the installation of the strainer would be acceptable. However, Operations had delayed implementing the recirculation test procedure in order to incorporate comments which were received after practicing the test on the simulator. As a result, the licensee planned to install the Unit 2 east CCP suction strainer and issue a shift manager's clearance to prevent the use of the Unit 2 east charging train until the recirculation test procedure changes were approved.

The inspectors questioned the use of the work control process to control the installation of the suction strainer. In the licensee's original plan, the Unit 2 east CCP suction strainer was to be installed as directed by a procedure which had received a safety evaluation in accordance with 10 CFR 50.59. The licensee's revised plan to use the work control process to control the strainer installation in lieu of the recirculation test procedure appeared to bypass the 10 CFR 50.59 safety evaluation which had been completed for the test procedure. The inspectors discussed this question with several attendees of the status meeting. The licensee personnel believed that, in accordance with Section 3.5.3 of EHP 5040.MOD.001, "Temporary Modifications," the strainer installation could be considered a "temporary condition" and the clearance permit system and work control process provided adequate control over the strainer installation. The licensee stated that system control would be maintained by not allowing the clearance tags to be removed until the step in the recirculation test procedure was reached which placed the strainer in service.

Procedure EHP 5040.MOD.001defined a "temporary condition" as, "an alteration to a structure, system, or component that is to remain out of service or be declared inoperable while maintenance is in progress. The inspectors determined that the definition of "temporary condition" applied to maintenance activities, not test activities; therefore, the strainer installation required a 10 CFR 50.59 safety evaluation. The inspectors noted that, because Unit 2 was defueled and the Unit 2 charging system was not required to be operable, the installation of the temporary suction strainer without a 10 CFR 50.59 safety evaluation would have been of negligible safety significance. After discussing the issue with the inspectors, the licensee changed the plan to install the temporary strainer to ensure that a 10 CFR 50.59 safety evaluation was completed prior to the installation.

c. Conclusions

The licensee revised a plan to install a temporary suction strainer on the Unit 2 East Centrifugal Charging Pump to allow the work control process to control the installation rather than a procedure. The inspectors concluded that the licensee's revised plan would have bypassed the procedure's 10 CFR 50.59 safety evaluation for installation of the temporary strainer. Subsequently, the licensee took corrective actions to ensure that the installation of the strainer was evaluated through the 10 CFR 50.59 evaluation process.

M3 Maintenance Procedures and Documentation

M3.1 Weak Configuration Control During TS Surveillance Test

a. Inspection Scope (61726)

In Section O1.2, above the inspectors discussed the follow-up to finding door 1-DR-AUX-391 blocked open. The inspectors performed additional follow-up on the licensee's procedure which verified compliance with TS surveillance requirement 4.9.12.d.4. Technical Specification surveillance 4.9.12.d.4 required that the spent fuel pool area be maintained at 1/8 inch water gauge negative pressure with respect to the outside atmosphere whenever the spent fuel pool ventilation was in operation. The inspectors evaluated the adequacy of configuration controls of the surveillance test boundary.

The inspectors assessed the observations and findings developed during this review as they related to the Manual Chapter 0350, Guidelines for Restart Approval, Item C.4.a, "Operability of TS Systems" and Item C.4.e, "Adequacy of Surveillance Tests/Test Program."

b. Observations and Findings

The inspectors reviewed 12-EHP 4030.STP.230, "Spent Fuel Storage Pool Exhaust Ventilation Tests," Revision 0, to evaluate the adequacy of the test boundary configuration controls. The inspectors determined that the surveillance procedure controlled the position of pressure boundary doors in the immediate vicinity of the spent fuel pool, but the procedure did not control the position of other auxiliary building pressure boundary doors. In addition, the inspectors determined that the surveillance procedure did not control or limit the operation of other interfacing and potentially

interfacing ventilation systems. After questioning system engineering personnel about the above configuration control weaknesses, the inspectors determined that the licensee's engineering department knew about the above weaknesses; however, plans to evaluate the effect of the positions of the auxiliary building pressure doors on the spent fuel pool ventilation were not being implemented.

Some of the auxiliary building pressure boundary doors that could affect the spent fuel pool area were several floors below the spent fuel pool area and were only open to the spent fuel pool area through three stairwells. The licensee believed that the effect these doors would have on the auxiliary building pressure boundary would be minimal. The inspectors requested the results of any tests or analyses which verified that the auxiliary building pressure boundary doors and interfacing ventilation systems would not adversely impact the TS 4.9.12.d.4 requirement. The licensee informed the inspectors that the requested information was not available and wrote CR 00-2032 to document the potential impact of the surveillance configuration control weaknesses on the spent fuel pool ventilation TS requirement. Due to both reactors being defueled, no fuel movement in progress, and no heavy loads moved over the spent fuel pool, the inspectors determined that the licensee had complied with the action statement requirements of TS 3.9.12.

The inspectors verified that the licensee's corrective actions to install and maintain configuration control of the auxiliary building pressure boundary doors and interfacing systems were scheduled to be implemented in a timely fashion. However, the inspectors noted that engineering support to resolve known configuration control weaknesses in a surveillance procedure was weak. Until the inspectors questioned system engineering, operations personnel had not been informed of the potential operability questions resulting from the configuration control weaknesses of the surveillance procedure.

c. Conclusions

Engineering support to resolve known configuration control weaknesses in a spent fuel pool ventilation system surveillance procedure was weak. The inspectors identified that the procedure did not control or limit the operation of other interfacing ventilation systems. System engineering personnel knew about the weaknesses in the surveillance procedure, but action had not yet been taken to address these weaknesses. The inspectors also noted that engineering had not informed operations about the configuration control weaknesses.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Cross Unit Dependancies of Control Room Ventilation Systems

a. Inspection Scope

On February 16, 2000, the inspectors questioned the impact of Unit 2 restart on Unit 1 control room habitability. The inspectors discussed this issue with systems engineering and operations personnel.

b. Observations and Findings

During the Expanded System Readiness Reviews (ESRR) performed in 1999, the licensee had determined there was a need to:

- Install redundant normal (in series) air intake isolation dampers to resolve single failure issues;
- Install redundant emergency (in parallel) air intake dampers to resolve single failure issues;
- Eliminate minor leakage paths;
- Perform other minor modifications and TS revisions to resolve control room ventilation questions.

The performance of the modifications ensured that the control room envelopes would remain habitable following a postulated design basis accident.

The licensee had scheduled the completion of the Unit 2 modifications to be completed prior to the reloading of fuel into the reactor vessel (Mode 6). In response to the inspectors questions, system engineering personnel stated that the modifications to the separate Unit 1 control room envelope would not be completed prior to Unit 2's entry into Mode 6 but would be completed prior to Unit 1's entry into Mode 6. The inspectors questioned the system engineering personnel as to the controls that would be in place during the time frame following Unit 2's entry into Mode 6 and until the modifications to Unit 1 were completed.

System engineering personnel stated that administrative controls were not planned because radiation protection personnel would perform surveys and inform the Unit 1 control room operators if there was a need to evacuate the control room. System engineering personnel stated because there was no fuel in the Unit 1 reactor vessel there was no TS requirement to maintain operators in the Unit 1 control room and this planned action was appropriate.

The inspectors determined that in the event of a postulated accident in Unit 2, dose rates in the unmodified Unit 1 control room envelope could be expected to exceed regulatory requirements (depending upon the accident and environmental conditions) and that the following issues had not been considered by the licensee:

- Unit 1 control room operator assistance to the Unit 2 control room,
- Notification of the control room operators regarding radiological conditions and control of a normally available doorway between the control rooms,
- Control of Unit 1 equipment that may be required to mitigate an accident on Unit 2. For example, NRC Inspection Report 50-315/316/99021 discussed a possible cross-unit dependency of the ESW system.

The licensee conducted an evaluation of the potential cross unit dependancies and initiated a focus team to identify and assess other potential cross unit dependancy issues.

c. Conclusions

The licensee had not fully examined the effects of a postulated radiological release on operators in the Unit 1 control room created by modifying only the Unit 2 control room pressure envelope. The licensee had initiated a focus team to identify and resolve potential cross unit dependancy issues.

E2.2 Review of Residual Heat Removal System Return to Operations

a. Inspection Scope (37751, 71707, C.4.f, C.4.j)

The inspectors reviewed the turnover of the residual heat removal system from engineering to operations. The system turnover process was being conducted as part of the expanded system readiness reviews (ESRR). At the time of the inspection, the RHR system turnover was in progress and had not been completed. The inspectors reviewed system turnover procedures, reviewed items contained in SIDS for proper scoping and disposition, attended various engineering meetings, and interviewed engineering and operations department personnel. The inspectors also conducted a walkdown of portions of the Unit 2 RHR system.

The inspectors also assessed the event as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant hardware issues resolved (i.e., equipment with poor material condition, equipment aging, modifications)," and C.4.j, "Adequacy of plant housekeeping and equipment storage."

b. Observations and Findings

The ESRR system turnover process was controlled by Procedures PMP 7200.RST.003, "System Turnover to Operations," and PMP 7200.RST.004. System turnover to operations was included within phase three of the ESRR program which included: review of the system work completion, disposition of incomplete work items, review of post restart and deferred work, and development of system performance monitoring program. In addition to the normally assigned system manager, each system was also assigned a system senior reactor operator (SRO) to support the implementation of the ESRR program.

The RHR system was divided into two functional areas: RHR/emergency core cooling and RHR/shutdown cooling. A system manager and a system SRO were assigned to each RHR functional area. The inspectors determined that the system managers and SRO were knowledgeable about issues affecting the return of the RHR system to an operational status, effectively communicated significant issues among themselves and to other departments within the licensee's organization, and fully participated in the ESRR program. The inspector concluded that the system managers and system SROs were effectively implementing the ESRR program.

The inspector sampled approximately forty SIDS items to determine if items were appropriately scoped, work item completion was adequately documented, post restart

items were appropriately deferred, and emergent items were appropriately evaluated and entered into the system. The inspectors identified no additional discrepancies during this review. Additional observations and findings regarding the review of the SIDS database are discussed above in Section O7.1.

The inspectors performed an independent walkdown of portions of the Unit 2 RHR system, including the RHR pumps, heat exchangers, and control valves. The inspectors identified no deficient conditions that were not previously identified by the licensee. At the time of the walkdown, the East RHR pump was in service and no excessive system vibrations or abnormal flow noise were identified. Housekeeping conditions and area lighting were adequate. The inspectors did not identify any improperly stored transient combustibles.

During the evaluation of RHR system turnover, the inspectors reviewed a number of technical issues associated with the RHR system, including system vibration during shutdown cooling operation and Maintenance Rule monitoring criteria for the system. The inspectors attended various engineering meetings associated with these issues. The inspectors determined that the level of meeting discussions were appropriate and effective, and meeting participants were knowledgeable and actively participated in meeting discussions. Notable observations and findings of this review are detailed below.

b.1 Resolution of RHR System Vibration

Prior to this inspection period, the RHR system has experienced periods of excessive vibration. This issue has been discussed in NRC Inspection Report No. 50-315/99001(DRP), 50-316/99001(DRP) and was being tracked under Inspector Followup Item (IFI) 50-315/99001-01. The licensee submitted Licensee Event Report (LER) 50-315/1999008-00 on April 9, 1999 to report the incidence of excessive RHR system vibration. Event Report 50-315/1999008 was included in the NRC restart action matrix (RAM) as Item R.1.26. Although the LER remained open at the time of the inspection pending the submittal of a supplemental LER, RAM Item R.1.26 had been closed during a previous NRC inspection. Section E8.4 of NRC Inspection Report No. 50-315, 50-316/1999-029 documented the closure of RAM Item R.1.26 based upon incorporation of the issue within the corrective action system with appropriate corrective action specified and tracked.

The licensee believed that the piping vibration was due to flow cavitation caused by high differential pressure across the RHR system flow control valves (IRV-310, IRV-311, and IRV-320). The flow cavitation has been associated with RHR system operation during conditions of low heat load (resulting in reduced heat exchanger flow rates and increased potential for flow cavitation at IRV-310 and IRV-320) and low RCS pressure (which reduces backpressure on the system flow control valves). Additionally, the licensee has determined that use of the normal RHR cooldown line exacerbated the conditions leading to flow cavitation. The licensee believed that the lower pressure drop associated with the normal cooldown line created favorable conditions for flow cavitation. To mitigate system vibration, the licensee used either of the two emergency core cooling injection lines as an alternate cooldown path. The licensee has also identified that cross train feeding though the RH-128E and RH-128W downstream of the RHR heat exchangers results in flow oscillations on the RHR flow instrumentation.

The inspectors identified a minor discrepancy between the FSAR and the RHR operating procedures associated with the use of the alternate ECCS injection lines. Specifically, Table 9.3-3, "Residual Heat Removal System Malfunction Analysis," Item 6 stated that in the event of the failure of the normal RHR discharge line, the low head safety injection lines may be opened to direct flow to the reactor coolant system cold legs, but a reactor coolant pump must be operated. This FSAR requirement was not reflected in the RHR system operating procedures. The licensee initiated CR 00-2695 to document and evaluate this FSAR discrepancy. The system manager stated that this issue did not represent a significant safety concern during Mode 5 and 6 operation.

The licensee has completed an operability determination for RHR system operation during Mode 5 (T_{avg} less than or equal to 200°F) and Mode 6 (refueling) operation. The licensee documented this evaluation in operability determination Nos. 91-18-ODE-060 and 91-18-ODE-355 and concluded that the RHR system was operable but degraded for Mode 5 and 6 operation. The specified compensatory actions for the RHR system included restrictions on the use of the normal cooldown path and procedural precautions to balance system flow rates to minimize system cavitation. At the time of the inspection, the licensee was performing an operability evaluation for RHR system operation during plant conditions other than Modes 5 and 6. Additionally, the licensee was evaluating the long term effects of RHR system vibration. The inspectors will continue to follow the licensees resolution of these issues under IFI 50-315/99001-01.

b.2 System Performance Monitoring

Step 1.4.3 of PMP 7200.RST.004 required development of performance monitoring baseline for system performance and trending. The licensee's system engineering manager informed the inspectors that guidance for the system performance monitoring program was under of the development at the time of the inspection. However, the licensee's Maintenance Rule program, required by 10 CFR 50.65, was anticipated to contribute system performance information into the monitoring program. Therefore, the inspectors reviewed the Maintenance Rule performance criteria established for the RHR system. The licensee was evaluating other system monitoring methods, in addition to Maintenance Rule monitoring, for selected systems.

The RHR system was divided into two Maintenance Rule risk significant system boundaries: emergency core cooling and shutdown cooling. At the time of the inspection, performance criteria for emergency core cooling functions were under development and were unavailable for review. The licensee wrote CR 99-23971 to track the development of performance criteria for the ECCS functions of RHR. The inspectors reviewed Maintenance Rule performance criteria for the RHR shutdown cooling functions, which had been approved by the licensee's Maintenance Rule expert panel, and interviewed the licensee's Maintenance Rule coordinator. Significant findings and observations are detailed below:

- The licensee had intended to scope the ECCS functions of the RHR system into the Maintenance Rule as applicable in operating Modes 1 through 3 (T_{avg} greater than or equal to 350°F). Similarly, the actions associated with CR 99-23971 were identified in SIDS as a Mode 3 constraint. After the inspector questioned the need for an operable residual heat removal pump and heat exchanger in Mode 4 per TS 3.5.2, "ECCS Subsystems - T_{avg} < 350°F," the licensee rescoped the applicable CR actions to a Mode 4 constraint.

- The identified shutdown RHR system functions did not include mitigation of boron dilution accident. Technical Specification 3.1.1.3 and 3.9.8.1 required the RHR system to provide minimum reactor coolant circulation for decay heat removal, to minimize the effects of a boron dilution accident and to prevent boron stratification. The Maintenance Rule functions for RHR shutdown cooling included decay heat removal for shutdown but did not include a specific reference to boron dilution and stratification concerns.

- The Maintenance Rule coordinator informed the inspectors that the RHR shutdown cooling performance criteria would be monitored on a per unit basis. Specifically, a functional failure of shutdown cooling would only occur if both RHR trains failed to provide shutdown cooling. Contrary to this, Engineering Head Instruction (EHI) 5035, "Maintenance Rule Program Administration," Revision 5, Step 3.7.3, stated that systems that are more risk significant must be monitored at the train level. The purpose of monitoring at a train level was to ensure that a good performing train would not mask the performance of a poorly performing train. The current shutdown cooling performance criteria identified that several shutdown cooling RHR functions were risk significant. The inspectors questioned the consistency of the guidance contained in EHI 5035 with the licensee plans to monitor shutdown cooling on a per unit basis.

- In some cases, the performance criteria associated with an identified function did not bound the Maintenance Rule function. For example, the performance criteria for the "decay heat removal during shutdown" function listed specific criteria for flow control valves and motor operated valves but did not include criteria for system flow, RHR pump performance, or heat exchanger performance. Furthermore, the specified motor operated valves did not include the motor operated valves used to align the alternate ECCS injection lines which had been used to minimize RHR system vibration (see Section E2.2.b.1 above).

The inspectors determined that the performance criteria for the RHR shutdown cooling function were not comprehensive. The licensee added a corrective action in CR 98-3495 to resolve these discrepancies. The licensee intended to reconvene the Maintenance Rule expert panel and re-evaluate the functional boundaries and performance criteria established for the RHR system.

c. Conclusions

The inspectors determined that the system return to operations process effectively evaluated and resolved issues associated with the RHR system. The system managers and SROs were knowledgeable, appropriately communicated significant systems issues, and were effectively implementing the process.

The inspectors determined that the licensee's implementation of maintenance rule performance criteria for residual heat removal system shutdown cooling function were not comprehensive. The licensee documented this issue in their corrective action system for evaluation and resolution.

The inspectors also assessed the RHR system return to operations process as it related to NRC Restart Action Plan 0350 Item C.4.f, "Significant hardware issues resolved (i.e., equipment with poor material condition, equipment aging, modifications," and C.4.j,

"Adequacy of plant housekeeping and equipment storage." The ESRR program and the system return to operations process effectively addressed significant hardware issues and tracked corrective actions for completion. During a walkdown of the RHR system, the inspectors concluded that housekeeping and equipment storage were adequate.

E8 Miscellaneous Engineering Issues

E8.1 Inspectors Review of Restart Action Matrix Items

In a letter dated July 30, 1998, the NRC informed the licensee that an oversight panel had been established in accordance with NRC Manual Chapter (MC) 0350, and a checklist was enclosed which specified activities which the NRC considered necessary to be addressed prior to restart. In accordance with MC 0350, an inspection plan was developed to evaluate the effectiveness of the licensee's actions to correct the items listed on the Case Specific Checklist.

In addition to the Case Specific Checklist, on November 22, 1999, the NRC MC 0350 oversight panel developed a Restart Action Matrix (RAM) to track the completion of NRC and licensee activities which were determined necessary for plant restart. The NRC MC 0350 oversight panel assessed the RAM items on the basis of importance, from "risk significant" to "little or no risk significance" and established criteria for inspection of the RAM items based on the relative risk. For low-risk significant items, the panel criteria required that: (1) the licensee had written a condition report to track the issue addressed by the RAM item, and (2) the licensee appropriately tracked the item as required for restart. The inspectors reviewed the following low-risk items and concluded that the licensee's actions met the requirements of the MC 0350 oversight panel restart criteria; therefore, the following items are discussed.

- (Closed) RAM Item R.2.2.2, IFI 50-315/316/96006-14: Slowed implementation of procedural improvements. The licensee has implemented an operations procedure upgrade program which was documented in CR 99-12799. This item is closed.

- (Closed) RAM Item R.2.3.1, IFI 50-315/316/96006-10: Technical operating guidance was promulgated to shift supervisors without indication that it had operations management approval for implementation. In 1998, a licensee self assessment identified that Technical Direction Memoranda were implementing changes without ensuring that a 10 CFR 50.59 review was performed.

  In response to the self assessment finding, the licensee revised the process for issuing technical direction. The technical direction procedure was superceded by procedure 12 EHP 5040.DES.001, "Control of Design Input." This procedure created a formal method for transmitting technical information through the use of a Design Input Transmittal and eliminated the use of Technical Direction Memoranda. Plant Mangers Instruction (PMI) 2260, "Standing Orders," required that all standing orders received a 10 CFR 50.59 review performed prior to being issued. The licensee documented this item in CR 98-0285. This item is closed.

- (Closed) RAM Item R.2.13.1, LER 50-316/99001-00: Degraded component cooling water flow to containment main steam line penetrations. The licensee completed an evaluation of the containment concrete and concluded that the

integrity of the containment boundary formed by the main steam line penetrations was maintained. The licensee documented this evaluation in CR 99-3641. A second evaluation of potential high temperature effects on the main steam penetration line sleeves, liners, and welds was being tracked as a corrective action item under CR 98-6832. The licensee planned to submit a supplement to the LER 50-316/99001-00 to include the results of the evaluations.

Licensee Event Report 50-316/99001-00 will remain open pending the inspectors' review of the LER supplement. Restart Action Matrix Item 2.13.1 is closed.

E8.2 (Closed) Restart Action Matrix Item 2.10.1: Debris of Unknown Origin Found in Containment Spray Header. In 1998, the licensee found foreign material resembling sludge and numerous pieces of solid debris during a boroscopic examination of the Unit 1 west containment spray system (CTS) lower ring header. The licensee documented this finding in CR 98-1905. During a subsequent investigation of the Unit 2 west CTS heat exchanger, a small amount of addition foreign material was found. Condition Report 99-8199 was written to document the additional material found in Unit 2, and the evaluation for the earlier Unit 1 CR was expanded to include the Unit 2 CR.

Based on the evaluation of the debris found in the Unit 1 west CTS lower ring header, the licensee determined that four corrective actions were necessary.

- Inspect and clean the Unit 2 CTS ring headers. The Unit 2 headers were cleaned on October 6, 1999 under Job Order (JO) C52585.

- Implement Design Change 12-DCP-221 for Unit 2 to remove 1-inch test lines which had never been used. The licensee determined that the isolation valves for the 1-inch test lines leaked during CTS pump testing, resulting in borated water entering the lower CTS ring headers. The Unit 2 1-inch test lines were cut and capped per 12-DCP-221 on November 22, 1998.

- Evaluate Unit 2 CTS/RHR as found piping internal material condition. The licensee's evaluation of the Unit 2 CTS cleaning was continuing; however, the action to clean and inspect the CTS ring headers had been completed. The licensee planned to include the results of the Unit 2 evaluation in a supplement to LER 50-315/98027.

- Develop an inspection program to identify any future degraded condition. The licensee planned to develop a program to periodically inspect the CTS ring headers for foreign material and boric acid deposits. This action was categorized as post-restart because the CTS ring headers had been recently flushed and inspected.

The inspectors reviewed the corrective actions and noted that not all of the licensee-identified restart action items for the Unit 1 CTS lower ring header debris were completed. However, the inspectors noted that the physical work required to clean the CTS ring headers was complete, that action had been taken to identify and correct the source of borated water leakage into the headers, and that the licensee planned to

develop a periodic inspection plan to identify any foreign material or boric acid deposits inside the CTS ring headers.

Licensee Event Report 50-315/98027-00 will remain open pending the inspectors' review of the LER supplement. The licensee planned to issue the supplement on February 29, 2000. Restart Action Matrix Item 2.10.1 is closed.

E8.3 Inspectors Review of NRC Manual Chapter 0350 Case Specific Checklist Items

In a letter dated July 30, 1998, the NRC informed the licensee that an oversight panel had been established in accordance with NRC Manual Chapter (MC) 0350, and a checklist was enclosed which specified activities which the NRC considered necessary to be addressed prior to restart. In accordance with MC 0350, an inspection plan was developed to evaluate the effectiveness of the licensee's actions to correct the items listed on the Case Specific Checklist. The inspectors reviewed the following Case Specific Checklist and concluded that the licensee's actions met the requirements of the MC 0350 oversight panel restart criteria; therefore, the following items are closed:

- (Closed) Case Specific Checklist Item C.2.1.a: Effectiveness of Quality Assurance Program. Case Specific Checklist Item C.2.1.a was closed based upon the inspectors' assessments of the licensee's quality assurance program as documented in NRC Inspection Reports 50-315/316/99021,024, 025, 026, 029, 032, 033, and 034. In assessing the effectiveness of the Quality Assurance Program the inspectors primarily considered two aspects of the program, the vitality of the site Corrective Action Program, and the effectiveness of the Performance Assurance organization. As documented in NRC Inspection Report 50-315/316/99021 an inspection team concluded that the D. C. Cook Corrective Action Program was capable of acceptably resolving identified conditions adverse to quality in a manner sufficient to support the plant's return to operation. This conclusion was based on a sample of the adequacy of licensee corrective actions to resolve programmatic deficiencies that were addressed by Restart Action Plans, technical issues that were identified in the Confirmatory Action Letter and the Restart Action Matrix, and a randomly selected sample of sixty closed, recent vintage condition reports for acceptable problem resolution. Regarding the effectiveness of the Performance Assurance group, inspectors have noted increased and effective involvement by the Performance Assurance group in providing independent oversight of activities. Specific examples include effective assessments of motor operated valve work activities documented in NRC Inspection Report 50-315/316/99021, and critical evaluations of issues regarding the hydrogen mitigation system documented in NRC Inspection Reports 50-315/316/99029.

  Overall, NRC inspection results concluded that the licensee's Quality Assurance program and processes were adequate to support the restart of the plant. This item is closed.

- (Closed) Case Specific Checklist Item C.2.1.d: Effectiveness of Deficiency Reporting System. Case Specific Checklist Item C.2.1.d was closed based upon the inspectors' assessments of the licensee's deficiency reporting system as documented in NRC Inspection Reports 50-315/316/99024, and 029. The inspectors' determined that corrective actions associated with implementation of

the new corrective action program were effective and had been properly implemented. The new program was rigorous and contained sufficient checks and balances to ensure that corrective actions were completed and their effectiveness was subsequently assessed. The inspectors also noted that the licensee's staff had continually monitored the program's effectiveness and adjusted it as needed to address problem areas. Consequently, the inspectors concluded that the D. C. Cook deficiency reporting system was capable of supporting the effective resolution of identified conditions adverse to quality in a manner sufficient to support the plant's return to operation. This item is closed.

- (Closed) Case Specific Checklist Item C.3.1.a: Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Staff). Case Specific Checklist Item C.3.1.a was closed based upon the inspectors' assessments of the licensee's demonstrated commitment to achieving improved performance as documented in NRC Inspection Reports 50-315/316/99001, 002, 003, 006, 007, 009, 013, 021, 024, and 029. The licensee's assessment teams consisted of licensee staff members across all organizational boundaries. The teams conducted the programmatic readiness assessment reviews using a structured approach and were successful in identifying issues potentially impacting department or program performance. This item is closed.

- (Closed) Case Specific Checklist Item C.3.2.a: Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Corporate Support). Case Specific Checklist Item C.3.2.a was closed based upon the inspectors' assessments of the licensee's demonstrated commitment to achieving improved performance as documented in NRC Inspection Reports 50-315/316/99001, 002, 003, 006, 007, 009, 013, 021, 024, and 029. The licensee's assessment teams conducted the programmatic readiness assessment reviews using a structured approach and were successful in identifying issues potentially impacting department or program performance. Further, the System Readiness Review Board, which was primarily a system support function established high expectations for the assessment process. In addition, functional area assessments in the areas of operations, maintenance and engineering and the assessment of the Corrective Action Program were successful in identifying potential restart issues and engineering process deficiencies. This item is closed.

- (Closed) Case Specific Checklist Item C.5.e: Confirmatory Action Letter conditions have been satisfied. This Case Specific Checklist item was closed based on inspector assessments of licensee corrective actions related to the specific issues identified in Confirmatory Action Letter RIII-97-011, dated September 19, 1997. NRC actions regarding the Confirmatory Action Letter were documented in a letter from the Regional Administrator to the licensee dated February 2, 2000. This item is closed.

E8.4 (Closed) Licensee Event Report 50-316/97003-03: Performance of Dual Unit Component Cooling Water Outage During Unit 2 1996 Refueling Outage Resulted in Condition Outside Plant's Design Basis. During the Unit 2 full core off-load outage in 1996 and with Unit 1 at 100 percent power, both Unit 2 CCW and ESW trains were taken out-of-service on August 7 through 8, 1996, leaving one Unit 1 CCW train

available to supply spent fuel pool cooling. The 10 CFR 50.59 SEs performed for the core off-load did not recognize that the Unit 1 CCW system could not perform its safety function under the design basis assumptions described in the USAR. This LER was related to violation 50-315/316/98152-01312 which was closed in NRC Inspection Report 50-315/316/99023. The LER did not reveal any new issues; therefore, this LER is closed.

E8.5 (Closed) Licensee Event Report 50-315/99028-00: ESF [Engineered Safety Features] Actuation and Start of Emergency Diesel Generator 1 CD During Transformer Maintenance. On December 16, 1999, workers performing corrective maintenance on the Unit 2 "A" Train reserve feed transformer (2-TR201CD), inadvertently caused an actuation of the sudden pressure relay. The relay actuation resulted in the loss of both units' reserve feed transformers and a consequent loss of spent fuel pool cooling. This event was discussed in Inspection Report 50-315/316/99021. The LER did not identify any additional issues; therefore this LER is closed.

IV. Plant Support

R1 Radiation Protection and Chemistry Controls (71750)

During normal resident inspection activities, routine observations were conducted in the area of radiation protection and chemistry controls using Inspection Procedure 71750. No uncontrolled releases of radioactive material were identified.

S1 Conduct of Security and Safeguards Activities (71750)

During normal resident inspection activities, routine observations were conducted in the area of security and safeguards activities using Inspection Procedure 71750. No discrepancies were noted.

F1 Control of Fire Protection Activities (71750)

During normal resident inspection activities, routine observations were conducted in the area of fire protection activities using Inspection Procedure 71750. No discrepancies were noted.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the licensee management at the conclusion of the inspection on February 25, 2000. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 Summary of MC 0350 Restart Action Matrix Items

The inspectors reviewed selected items from the NRC Inspection Manual Chapter 0350 Case Specific Checklist (CSC) and the Restart Action Matrix (RAM). The following list indicates NRC CSC and RAM Items which are discussed in the report:

- CSC Item C.2.1.a, "Effectiveness of Quality Assurance Program," is discussed in Section E8.1. This item is closed.
- CSC Item C.2.1.d, "Effectiveness of Deficiency Reporting System," is discussed in Section E8.1. This item is closed.
- CSC Item C.3.1.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment," is discussed in Section E8.1. This item is closed.
- CSC Item C.3.2.a, "Demonstrated Commitment to Achieving Improved Performance Through the Results of the Programmatic Readiness Assessment (Corporate Support)," is discussed in Section E8.1. This item is closed.
- CSC Item C.5.e, "Confirmatory Action Letter Conditions Have Been Satisfied," is discussed in Section E8.1. This item is closed.
- RAM Item R.2.2.2, "Slowed Implementation of Procedural Improvements," is discussed in Section E8.2. This item is closed.
- RAM Item R.2.3.1, "Technical Operating Guidance Was Promulgated to Shift Supervisors Without Indication That It Had Operations Management Approval for Implementation," is discussed in Section E8.2. This item is closed.
- RAM Item R.2.10.1, "Debris of Unknown Origin Found in Containment Spray Header," is discussed in Section E8.4. This item is closed.
- RAM Item R.2.13.1, "Degraded Component Cooling Water Flow to Containment Main Steam Line Penetrations," is discussed in Section E8.2. This item is closed.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

#R. Crane, Regulatory Affairs Supervisor
#D. Garner, Director, Nuclear Fuel Safety and Analysis
#S. Greenlee, Director, Design Engineering
#R. Godley, Director, Regulatory Affairs
#R. Huey, Performance Assurance
#I. Jackiw, Regulatory Affairs
#J. Long, Chemistry, Radiation Protection, and Environmental Supervisor
#M. Marano, Director, Business Services
#J. Molden, Director, Maintenance
#T. Mountain, Regulatory Affairs
#D. Naughton, System Engineering
#E. Nelson, Nuclear Documentation Management
#S. Partin, Operations
#J. Pollack, Plant Manager
#R. Powers, Senior Vice President
#M. Rencheck, Vice President, Nuclear Engineering
#C. Vanderzwaag, Engineering

# Denotes those present at the February 25, 2000, exit meeting.

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92700:	Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities

NRC MANUAL CHAPTER 0350 ITEMS DISCUSSED

- Item C.1.2.e, "Corrective Actions Include Restoring Systems and Equipment to Service."
- Item C.4.a, "Operability of TS systems."
- Item C.4.d, "Adequacy of System Lineups."
- Item C.4.e, "Adequacy of Surveillance Tests and Test Program."
- Item C.4.f, "Significant Hardware Issues Resolved."
- Item C.4.i, "Maintenance Backlog Managed and Impact on Operations Assessed."
- Item C.4.j, "Adequacy of plant housekeeping and equipment storage."

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-315/99022-01 50-316/99022-01	NCV	Inadequate configuration control in that auxiliary building pressure boundary barrier 1-DR-AUX-391

Closed

50-315/96006-10 50-316/96006-10	IFI	Technical operating guidance was promulgated to shift supervisors without indication that it had operations management approval for implementation
50-315/96006-14 50-316/96006-14	IFI	Slowed implementation of procedural improvements
50-316/97003-03	LER	Performance of dual unit component cooling water outage during Unit 2 1996 refueling outage resulted in condition outside plant's design basis
50-315/99022-01 50-316/99022-01	NCV	Inadequate configuration control in that auxiliary building pressure boundary barrier 1-DR-AUX-391

Discussed

50-315/98027-00	LER	Debris of unknown origin found in containment spray header
50-316/99001-00	LER	Degraded component cooling water flow to containment main steam line penetrations
50-315/99001-01	IFI	Residual heat removal system vibration

LIST OF ACRONYMS

AR	Action Request
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
D/G	Diesel Generator
DHSO	Department Head Standing Order
DRP	Division of Reactor Projects
ESRR	Expanded System Readiness Review
ESW	Essential Service Water
IHP	Instrument Head Procedure
IMP	Instrument Maintenance Procedure
IST	In-Service Test
JO	Job Order
MC	Manual Chapter
MCCB	Molded Case Circuit Breaker
MHP	Maintenance Head Procedure
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OHI	Operations Head Instruction
OHP	Operations Head Procedure
OSO	Operations Standing Order
PA	Performance Assurance
PMI	Plant Manager's Instruction
PMP	Plant Manager's Procedure
PMSO	Plant Manager's Standing Order
PMT	Post Maintenance Testing
PDR	Public Document Room
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SRO	Senior Reactor Operator
STP	Surveillance Test Procedure
SWO	Stop Work Order
TS	Technical Specification
VIO	Violation